

of most unsanitary character, great care will be necessary to avoid contracting the numerous diseases associated with such conditions.

Caracas is not a favorable place from which to explore the resources of Venezuela. It lies too far from the most interesting portions of the country. The Orinoco can be ascended better from Trinidad, and the Sierra Nevada requires an expedition on muleback to reach it. From descriptions given by travelers on the Orinoco and its branches, the dangers from fever in the forest regions of Venezuela are very great, and anyone undertaking their exploration risks his life. Mr. E. André, whose travels into the interior have been as extensive as any of recent years, said he would not think of taking with him any person who had not lived at least two years in the tropics and become acclimated as far as possible to conditions similar to those in Venezuela.—
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SOME SPECIES OF TETRANEURIS AND ITS ALLIES.

WE sometimes hear the statement that the difficulties for the systematic botanist are being multiplied by the breaking up of so many of the old genera and the creation of new species from former aggregates, but practical experience shows, it seems to me, that segregation, when based on describable characters, certainly simplifies. The replacing of the untenable *Actinella* by *Tetraneuris*, *Rydbergia*, and *Picradenia* (Pitt. 3: 265), is a case in point.

The reduction of several good species to one (an aggregate) makes necessary a description so general that the amateur in the field has no difficulty in placing the most aberrant form until he collects a suite of specimens clearly unlike. In the past, reduction of species has often occurred because certain ones were rare and hence not well represented in the herbaria, but it seems unfair to eliminate a species simply because it exists in a locality not easily accessible or rarely visited.

Being located in the center of distribution of *Tetraneuris* and its allies, I became interested in the group. The following notes and descriptions are offered as supplementary to Dr. Greene's valuable paper cited above.

TETRANEURIS ACAULIS (Pursh) Greene, Pitt. 3: 265. 1898.

Galardia acaulis Pursh, Fl. 2: 743. 1814. *Actinella acaulis* Nutt. T. & G. F. 2: 381. 1842, etc.

As limited by the earlier writers this is a variable but a recognizable species. When many of the following were incorporated, the difficulties of the field botanist were multiplied several fold in respect to this species.

TETRANEURIS ACAULIS cæspitosa, n. var.—Strongly matted, depressed-spreading, the numerous branches of the caudex much thickened by the imbricated leaf-bases: leaves very numerous and crowded, densely silky-lanate as are also the scapes and involucre: heads nearly sessile or on scapes 3–6^{cm} long.

That specimens of this variety exist in some herbaria as *T. acaulis* is possible, though in the large series in the Herb. Mo. Bot. Garden none were found. Its matted habit, silky-lanate leaves and very short scapes easily separate it. It occurs sparingly on sandy ridges in the foothills. Laramie hills nos. 1890 and 4314 represent it.

Tetranneuris simplex, n. sp.—Tap root vertical, short, comparatively small with few or many secondary roots: caudex short, consisting of one or more thick crowns which are densely covered with brown dead leaf-bases: leaves appressed-pubescent (not silky), nearly naked in the axils or sparsely long-hairy, glabrate in age when the fine punctation becomes evident, crowded on the crowns, ascending or erect, linear-spatulate, tapering only slightly to the margined base, subacute, 4–7^{cm} long: scapes simple, single from the crowns, 15–25^{cm} high, slender, erect, lightly pubescent below, becoming silky or lanate above and on the involucre: head large, 2.5–4^{cm} across; rays with a broad ligule (5–8^{mm}): akene pubescent.

To include this with *T. acaulis* is not conducive to clearness. Dr. Greene (*l. c.*) has separated some of the other well marked species and this seems to me to be as good as the best of them. I have had this and *T. acaulis* under observation for several years, and there is not the slightest possibility of confounding the two in the field. *T. acaulis* is always cespitose, often in considerable mats, the scapes are shorter, the heads smaller, and the rays narrower than in *T. simplex*. The leaves of the latter are comparatively glabrate from the first, strongly in contrast to the silky or even lanate pubescence of the other.

That collectors have never been inclined to call this *T. acaulis* is shown by the fact that specimens of it occur in the herbaria just as often ticketed *T. scaposa* or *T. scaposa linearis*, though to these it is not so closely related. Whether *T. acaulis* or *T. simplex* is the original *Galardia acaulis* is difficult to determine, but the term "pilosa" in the original description, and the

agreement in Nutt. Gen. 173 and T. & G. Fl. that the leaves are "sericeously (silky) villous," and that the plants are aggregated in dense tufts, suggests the separation that is now proposed.

Besides a large series of plants from near Laramie, specimens of *T. simplex* have been examined as follows: T. A. Williams, Pine Ridge, Neb.; J. Schenck, Neb., 1893; H. J. Webber, Pine Ridge, Neb., 1889; Henry Engelmann, North Fork of the Platte, 1858; A. S. Hitchcock, Kan., 1895, no. 289; C. H. Thompson, Kan., 1893, no. 169; Capt. Bryan's Expedition Lower Pole Creek, Wyo., 1858; R. S. Williams, Great Falls, Mont., 1891, no. 82; G. E. Osterhout, Livermore, Colo., 1898; M. E. Jones, Cheyenne Cañon, Colo., 1878; Hall & Harbour, no. 275.

***Tetraneuris incana*, n. sp.**—Root rather slender, simple or branched; caudex simple or few branched, the crowns enlarged by a dense covering of the broadly expanded bases of the petioles which are more or less involved in white, hirsute wool: leaves crowded on the crowns, silvery-white with an appressed pubescence, linear-oblan- ceolate, 2–4^{cm} long: scapes naked, single from the crowns, slender, curved-ascending, 1–2^{dm} high, the fine silvery pubescence slightly spreading: involucre silvery-silky, bracts few, shorter than the 1^{cm} high disk, the outer oblong, obtuse, the inner spatulate, scarious margined: rays few, the ligule as long as the disk: disk corollas sprinkled with resinous globules and toward the summit strongly thickened by a dense, penicillate, glandular beard: pappus scales oblong, aristate: akene slender, nearly as long as the corolla, pubescent.

This rare species is strongly marked in its close, silvery pubescence, its nearly simple caudex, its silvery involucre, and its dense coat of glandular hairs on the corollas. The only collections of it at hand are no. 393, Platte hills near Fairbanks, July 11, 1894; no. 5006 (type number), by Mr. Elias Nelson Wallace creek, July 30, 1898; and a specimen by Mrs. Muth, Lewis & Clarke co., Mont. Its habitat is white clay ridges among the barren hills.

TETRANEURIS TORREYANA (Nutt.) Greene, l. c.

Actinella Torreyana Nutt., Trans. Am. Phil. Soc. 7: 379. 1841.

A strong species of the central-eastern Rocky mountains; in several forms, but always tufted, strongly punctate and nearly glabrous except on the caudex; somewhat variable as to the width and rigidity of the leaves. My no. 4810, from the Platte hills near Fort Steele, June 18, 1898, are nearly typical; nos. 4571 and 4747, June 1898, from the Tertiary clays of south-central Wyoming have broader, laxer leaves

than the original description permits. A form represented by no. 4327 and some earlier collections, from the limestone ledges of the Laramie hills, is strongly matted and has the branches of the caudex enormously thickened and protected by the densely lanate leaf-bases. Add to this its large root, broad green leaves, and the copious secretion of its punctate glands, and it might well stand as var. *glandulosa*. It is in this species that the salient character of the genus (4-nerved ligules) often fails; 5-8 nerves are not infrequent.

Tetranneuris Mancosensis, n. sp.—Tufted, with woody root and multipital caudex, the short thickened crowns clothed with the expanded, membranous, lanate leaf-bases: leaves glabrous, 4-8^{cm} long, crowded on the crowns, linear or linear-oblong, acute or cuspidate, rather minutely punctate: stems few to several, bearing a few (usually 2) distant leaves, 2^{dm} in length (including the long monocephalous peduncle): heads large, disk about 1^{cm} high; involucre silky-lanate, the bracts in two or three rows, the inner oblong or somewhat expanded upwards by the scarious margins: paleæ of the pappus oblong-elliptic with an acunation as long as the body proper, equaling the disk corollas: ligules of the rays 15-18^{mm} long, 6-8^{mm} broad.

Collected by Professor C. S. Crandall, Mancos, Colo., June 29, 1898, and distributed as *Actinella scaposa linearis* Nutt. It is in fact, however, much nearer to *T. Torreyana*, from which its slenderer, longer, and less conspicuously punctate leaves, its nearly glabrous two- or three-leaved stems, its long-peduncled heads, and long pappus paleæ at once separate it.

TETRANNEURIS LANATA (Nutt.) Greene, l. c.

Actinella lanata Nutt. l. c.

A rare plant of the arid interior, on dry ridges on the high plains. Only the following collections of it have been secured by the writer: 3068 and 4726 from Green river, in 1897 and 1898 respectively; 4607 from Ft. Bridger, June 9, 1898 are young specimens, but probably the same. More or less of the wool is permanent even on the leaves, though these show some punctation on the glabrate areas.

RYDBERGIA GRANDIFLORA (T. & G.) Greene, l. c.

Actinella grandiflora T. & G., Journ. Bost. Soc. Nat. Hist. 5: 110. 1847.

This occurs in abundance in the alpine regions of all our mountain ranges.

PICRADENIA RICHARDSONII Hook., Fl. 1: 317. *pl.* 108. 1833.—That authentic specimens of this occur in this range is possible, but it seems

quite certain that the wide range attributed to this species in Gray's *Synoptical Flora* is due to other species being included. With the erection of *P. floribunda* (Gray) Greene and *P. canescens* (Eaton) Greene into species the area covered has also been segregated. But even after the establishment of the two following species some Rocky mountain forms, such as my no. —, are still left to represent the original species.

PICRADENIA LIGULÆFLORA Aven Nelson, Bull. Torr. Bot. Club 25: 378. 1898.

This species is proving to be far more common than was at first suspected. As to habitat see notes on the following species.

Picradenia macrantha, n. sp.—Caudex branched, each branch surmounted by a few to several crowns; crowns clothed with the lanate leaf-bases: stems single from each crown, erect, fascicled, sparsely pubescent, somewhat striate, about 15^{cm} high: leaves glabrate, not conspicuously punctate, rather numerous on both crowns and stems, slender petioled, the blade variously parted into linear divisions, most of them pedately trifid, some of the stem leaves pinnately parted or twice trifid, the uppermost sometimes simple: heads large, peduncled, one to five on each stem (generally two or three): involucre shorter than the disk flowers, outer bracts lanceolate, nearly glabrous, united for half their length, 6^{mm} long; inner oblong, acute, scarious margined: rays 6–10, chrome yellow, the ligule 15–18^{mm} long and one third as broad: pappus scales 5–7, lanceolate, shorter than the corolla.

Allied to *P. ligulæflora*, from which its larger size, conspicuous rays, longer peduncles, fewer and less resinous heads serve to separate it. The habitat of this is open, stony slopes in the mountains or hills, while *P. ligulæflora* occurs on dry, clayey, alkaline ridges or flats on the open plains. Type number 4830, Fort Steele, June 18, 1898. What seems to be the same thing is no. 1688, Centennial hills, Aug., 1895; also South Park, Colo., 1878, by Marcus E. Jones.—AVEN NELSON, *University of Wyoming*.

PYCNANTHEMUM VERTICILLATUM, A MISINTERPRETED MINT.

MR. W. W. EGGLESTON has called my attention to a *Pycnanthemum*, abundant about Rutland, Vermont, which has been placed by recent botanists with both *P. muticum* Pers. and *P. Torreyi* Benth. but appears different from either of those species. In its habit